REMARKS/ARGUMENTS

Claims 1-6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,485,590 to Hyatt et al. in view of U.S. Patent No. 6,651,110 to Caspers et al. Claim 7 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Hyatt in view of Caspers as applied to claim 1, and further in view of U.S. Patent No. 6,518,980 to DeMotte et al.

The essence of Applicants' invention relates to an active input/output (I/O) module forming a node of an industrial control network and what occurs in the event of a failure of the I/O module within the network. The industrial control network includes a central controller in the form of a PC, a Programmable Logic Controller (PLC), or micro-controller which is connected by means of a network bus to the active I/O module which operates as a node within the network. Each active I/O module includes plural bus and device input and output data connectors mounted to a housing of the module. The active I/O module further includes a central processor unit connected to the network and to the data bus as well as to input and output devices via the aforementioned device data connectors.

Failure of an active I/O module or damage to any of its input or output connectors requires the removal and replacement of the module. The connectors are particularly subject to damage because of the typically high speed, very busy and high density industrial environments in which the I/O module is commonly employed. In the past, the replacement module must then undergo reinstallation of the software parameters specific to that node within the network because removal of the failed module also removes all data specific to that particular node. Replacement of an active I/O module thus required the services of a skilled controls (or network) engineer because of the requirement to re-configure the module-specific software parameters

associated with the failed or damaged I/O module. Reinstallation of the module-specific software parameters typically requires considerable time because a skilled controls engineer is not normally readily available at a typical application site. In addition, the controls (or network) engineer may require information and data from a separate source to identify the software and data associated with a particular failed module. These factors make the replacement of an I/O module a considerably complicated task typically involving substantial network downtime.

Applicants' invention, on the other hand, avoids these problems encountered in the prior art in replacing an active I/O module in an industrial control network by providing within the housing of the module a removable memory module storing data specific to the node represented by the I/O module. This arrangement permits the I/O module to be replaced upon failure of, or damage to, the module with a new I/O module capable of receiving the removable memory unit to re-constitute the I/O module without having to re-program the node-specific data on site through the efforts of a skilled engineer. The removable memory unit may be easily installed with a minimum of time and effort within the replacement I/O module by a technician. This inventive arrangement thus substantially reduces network maintenance costs and network downtime caused by a failed module representing a node within the network. This ease of replacement of an I/O module by incorporating a removable memory module programmed with node-specific data is not disclosed in the prior art cited in the Office Action. Although each of the three cited prior art references may include bits and pieces of Applicants' invention, none of these references discloses or even suggests the concept of facilitating replacement of an I/O module forming a node in an industrial control network by programming a removable memory within the I/O module with node-specific data to facilitate removal and replacement of a failed or

damaged I/O module with another I/O module into which the removable memory module is installed. Moreover, as discussed in the following paragraphs, there is no suggestion in any of the references cited in the Office Action to combine it with any other reference to provide this capability.

The patent to Hyatt is directed to a programmable controller communication interface module 15 which is configurable by a removable memory cartridge. The communication interface module 15 couples input and output (I/O) devices 17 and other remote apparatus to a programmable controller 10 and is not an active connectivity module representing a node in a control network, as is the claimed invention. The programmable controller 10 is described as including a processor module 12 for storing and executing a user-defined control program to control the operation of a machine. See column 3, lines 43-52. As such, Hyatt is directed to a programmable logic controller and not to the claimed active connectivity module representing a node. In addition to the processor module 12, the programmable controller 10 includes a serial communication module 15 which exchanges data between sensing and operating devices via a serial communication link 16. The programmable controller 10 of Hyatt does not function as an active connectivity module representing a node, nor do the removable communication protocol cartridges of Hyatt store information unique to a network node with which the module is associated. The programmable controller 10 of Hyatt is not described as even being associated with a node within a control network.

The Hyatt reference is relied upon as disclosing removable memory cartridges, but the Examiner concedes that the removable memory cartridges in Hyatt do not store information unique to the network. Rather, the removable memory cartridges in Hyatt store various

communication protocols used by the communication interface module requiring the user to select parameter options, such as baud rate, the length of the data characters, and the number of bits, allowing the user the opportunity to configure the port circuit by selecting specific communications options. See column 2, lines 57-66. Each protocol cartridge stores two different communication protocol programs for the three I/O ports 14a-c of the module. See column 4, lines 6-8. Thus, the removable memory cartridges in Hyatt clearly do not store information unique to a network node which would allow the programmable controller communication interface module of Hyatt to be replaced without requiring the programming in its memory of module-specific software parameters associated with the failed or damaged module being replaced. This aspect of Applicants' invention which is recited in all the pending claims is clearly neither disclosed nor even suggested in Hyatt. There is no discussion in Hyatt of the replacement of a damaged or failed serial communication module 15, nor that the removable communication protocol cartridges 20a and 20b could be used to facilitate replacement of a damaged or failed serial communication module.

The Examiner relies upon the Caspers reference as disclosing the storing of address data representing the address of a network node with which a module is associated. The Examiner also relies upon Caspers as teaching the storing in a memory unit of "network configuration data including data sheet parameters associated with said node". Caspers discloses "a dedicated memory object which can be imbedded into industrial control and monitoring equipment" to simplify programming and provide dedicated memory for specific types of data for identifying, monitoring and controlling system components. See column 1, lines 38-57. Thus, Caspers does not contemplate the use of a removable memory storing node-specific data to facilitate

replacement of a module forming the node or incorporating a removable memory unit in a replacement module in order to avoid reprogramming the replacement module with the node-specific data which allows it to operate in an industrial control network, as in the claimed invention.

In Caspers, first and second memory objects 100 and 102 shown in FIG. 5 are described as provided in database 96 which is stored within computer 64 as shown in FIG. 4. Processor 88 which is also within computer 64 relies upon database 96 including its first and second memory objects 100 and 102 for many of the controller monitoring functions, including communications with the system computers, programming or reprogramming of the system components, and generation of user viewable representations of the system. Computer 64 is described as being within a monitoring station 18 as shown in FIGS. 1 and 4. As such, monitoring station 18 is shown separate and apart from the remote resources/monitoring equipment 30. The remote resources/monitoring equipment 30 in Caspers is not the equivalent of the active connectivity module representing a node of Applicants' invention. In Caspers, the aforementioned monitoring station 18 is connected to the remote resources/monitoring equipment 30 by means of the wide area network 28 as shown in FIG. 1. Thus, the first and second memory objects 100 and 102 are not located in a remote active connective module representing a node as in the claimed invention, but rather are centrally located in the monitoring station 18 which, in combination with controller 16, interconnects various component assemblies 12 and remote resources/monitoring equipment 30 via network 14. See column 3, lines 36-41. In addition, contrary to the assertion on page 5 of the Office Action, neither the memory circuit 94 nor the database 96 within Caspers' computer 64 are described as removably mounted on a housing as is

the claimed "memory module". Caspers in column 3, lines 54-60, describes the control or monitoring stations 18 as being linked to outside elements, i.e., nodes, by wide area networks 28, such as the Internet.

Finally, while Caspers contemplates the use of a dedicated memory for storing system designation data, component designation data, and data descriptive of the function of the component, as described in the Abstract, the memory storing this data is clearly imbedded in the networked, programmable electrical components, which memory is not intended nor adapted for use in a replacement component, as any replacement component in Caspers would have to be re-programmed with this dedicated memory data which is precisely the situation which Applicants' invention avoids.

The Examiner relies upon DeMotte, in combination with Hyatt and Caspers, in rejecting dependent claim 7 as disclosing the storing of storage and maintenance data, including an error log and initial startup parameters and date and time data in a memory. DeMotte discloses a method and system for allowing a remote computer 22 to communicate with at least one programmable controller 12 having a memory for storing plural types of data objects. The programmable controller 12 includes an interface module 30 for receiving a request from the remote computer 22 for one of the data objects stored in the programmable controller. A data converter module 32 determines the type of data object being requested and automatically converts the data into a comprehensible format based on the type of data object. The interface module 30 then generates a user display in response to the request for transmission to the remote computer 22 which includes a display for displaying the user display so as to allow a user to access the comprehensible format of the requested data. See Abstract. DeMotte is thus directed

to a specific arrangement for enabling communication between a programmable controller and a remote computer having varying types of data objects stored therein by converting the data into a comprehensible format based on the type of the data object and then generating a user display for allowing the user to access the comprehensible format of the requested data. DeMotte does not include any provision for replacing a damaged of failed programmable module, nor does DeMotte disclose the use of a removable memory for use in an active connectivity module representing a node in an industrial control network, as in the claimed invention. The Examiner has therefore established no relationship between DeMotte and Hyatt's use of removable memory cartridges, nor any relationship of DeMotte with Casper's dedicated memory object embedded in networked, programmable components for receiving system and component-specific data.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference, or references when combined, must teach or suggest all the claimed limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and must not be based on applicant's disclosure. *In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).* Moreover, the initial burden is on the Examiner to provide some suggestion in the prior art of the desirability of doing what the inventor has done. The Office Action states that the configurable memory object of Caspers, the programmable controller commmunication interface module of Hyatt, and the data interface converter module of DeMotte are all "analogous". However, each

of these systems and methods has a different intended purpose, specific implementation and final outcome or result. And none of these three references has as a goal the facilitation of the replacement of a damaged or failed module in an industrial control network. Perhaps the three cited references are "analogous" only in their applicability to industrial automation and control systems. In the present rejection, the Examiner has merely located three isolated references which allegedly disclose separate portions of Applicants' invention. The Examiner has failed to provide any support that any of the cited references, or any combination of these references, expressly or impliedly suggest the claimed invention. Nor has the Examiner presented a convincing line of reasoning as to why one skilled in the art would have found the claimed invention to have been obvious in light of the teachings of the references themselves. The Examiner is required to set forth a convincing line of reasoning leading to the obvious combination of the cited references. *Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).* The Examiner has neither provided the suggestion or motivation in any of the three cited references to combine it with the other references, nor has the Examiner presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the three cited references. The law requires more than mere speculation and piecemeal selection of elements of the prior art. In fact, such an approach to the ultimate legal conclusion of non-obviousness is expressly forbidden by the Federal Circuit Court of Appeals, W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983)

The pending claims, are believed to be patentably distinguishable from the combination of references cited in the Office Action. Therefore, reconsideration of these claims is respectfully solicited.

Respectfully submitted,

Date: August 19, 2004

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